

APRIL/MAY 2025

**23PMB31 — SOIL AND ENVIRONMENTAL
MICROBIOLOGY**

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. What is soil profile?
2. Define biological nitrogen fixation.
3. What is mutualism?
4. Name two plant growth-promoting bacteria (PGPR).
5. Define rhizosphere effect.
6. What is nitrogen cycle?
7. What is vermicomposting?
8. What is E-waste?
9. What are halocarbons?
10. Define Environmental Impact Assessment (EIA).



SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Discuss the role of microorganisms in soil fertility.

Or

- (b) Explain the process of mineralization of organic matter in soil.

12. (a) Describe the different types of microbial interactions in soil.

Or

- (b) Explain the role of phosphate-solubilizing bacteria in promoting plant growth.

13. (a) Describe the components of the environment and their significance.

Or

- (b) Discuss the carbon cycle in an ecosystem.

14. (a) Explain the primary, secondary, and tertiary treatment processes in wastewater treatment.

Or

- (b) Discuss the factors affecting solid waste generation rates.

15. (a) Describe the biodegradation of DDT.

Or

- (b) Discuss the pollution control bodies and environmental laws in India.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Analyze the diversity and distribution of microorganisms in soil and their role in soil formation.

17. Discuss the beneficial applications of microbial interactions like mutualism, commensalism and symbiosis in agriculture.

18. Explain the methods for detecting the portability of water samples and the measures to control waterborne diseases.

19. Describe the role of microorganisms in solid waste management, focusing on composting, vermicomposting, and biogas production.

20. Evaluate the impact of biodegradation of xenobiotics like PCBs and synthetic polymers on the environment.

